versity of Amsterdam, and this chair he held until the time of his death.

In the Dutch universities seven years is the minimum period of study required for graduation, and the last of these is devoted to original research. The work undertaken by Roozeboom on the hydrates of the halogens and their hydrides led him at once to the problems with which his name will always be associated.

In the course of his experiments he came upon phenomena which he was unable to explain. At that time the conditions which determine equilibrium in chemical systems were little understood by chemists. About ten years before, the American physicist, Willard Gibbs, had developed a theory of equilibrium between materials in contact which was completely independent of all assumptions as to the nature of matter or as to molecular structure. Given a system constituted of homogeneous portions (phases, as they are called, P in number) separated from each other by definite surfaces of contact, and made up of constituents (components, as they are termed, C in number) the amounts of which present in the system can alter independently of the others, Gibbs had shown that, considering only the temperature and pressure under which the system exists and the concentration of the components, the number F of the latter conditions (degrees of freedom, as they are called) to which arbitrary values must be assigned to describe the system perfectly are given by the expression $F = C - P + 2$, this numerical relationship being known as the "phase rule."

Gibbs had published his results in a journal not widely circulated—the Transactions of the Connecticut Academy. They were, moreover, presented in a mathematical form unfamiliar to chemists, and had consequently remained scarcely noticed all these years. Prof. van der Waals, to whom Gibbs's work was known, hearing of Roozeboom's difficulty, suggested to him that this mode of regarding equilibrium might throw light upon it. Roozeboom's philosophical mind at once grasped the immense possibilities of this new method of regarding problems of equilibrium, and from that time he occupied himself with brilliant success in working out its application to chemistry.

The investigations of Roozeboom and of those whom he interested in this branch of physical chemistry have cleared up our ideas in a surprising way, and opened out fresh paths of inquiry in the attractive region which connects chemistry and physics. The great merit of first applying the phase rule in chemistry must be attributed to Roozeboom, and gives him a high place among the founders of the new chemistry.

An account of the many applications of the phase rule to chemical problems was written by Roozeboom in his well-known book "Die heterogenen Gleichgewichte vom Standpunkte der Phasenlehre," of which two parts only have yet appeared. He had prepared all the necessary material, and was about to begin writing the third and concluding part at the time of his death.

Apart from scientific work his life was uneventful. His simplicity of character and extreme desire to do justice to every fellow-worker won him the affection of all who came to know him well. In 1890 he was made a member of the Royal Academy of Science of Amsterdam. Totally devoid of any trace of the advertising spirit, he received fewer public honours than might have been expected to follow his notable achievements, and everyone must feel regret that the scientific world did not in his lifetime more adequately recognise his services. F. D. CHATTAWAY.

NOTES.

THERE is every likelihood that Lord Lister's eightieth birthday, on April 4, will be suitably celebrated by his friends and admirers. A committee is being formed, consisting of representatives of medicine and science, with a view to carry into effect a suggestion made, we learn from the *British Medical Journal*, by Dr. C. J. Martin, F.R.S., the director of the Lister Institute. Dr. Martin has proposed that the best form in which to convey to Lord Lister the admiration and regard of his fellow-workers and followers would be the re-publication of all his scientific papers, prefaced by a biography of Lister containing an account of the part he took in the development of present knowledge of infectious processes, and of his efforts to avoid wound infection, the successful result of which revolutionised surgery. Dr. Martin will be glad to receive at the Lister Institute, Chelsea Gardens, S.W., the names of persons who desire to participate in this happy idea.

Science announces that the Rumford medal of the American Academy of Arts and Sciences "for discoveries in light and heat" has been awarded to Prof. E. F. Nichols, of Columbia University.

THE death is announced, in his seventy-fifth year, of Sir Thomas Hanbury, K.C.V.O., at one time of Shanghai, the founder of the Hanbury Botanical Institute at the Royal University, Genoa, and of the Museum Præhistoricum, near Mentone.

WE learn from the *Athenaeum* that the third congress of the Prehistoric Society of France will be held at Autun on August 13–18. Excursions will be made to Mâcon, to Mont-Auxois (the ancient Alesia), to Mont-Beuvray (the ancient Bibracte), and to Solutré. Dr. Marcel Baudouin, 21 rue Linné, Paris, is the secretary.

PETITIONS in support of the Metric Weights and Measures Bill, which is down for second reading on March 22, are being signed by many public bodies and institutions throughout the country. Among the petitions already received by the Decimal Association for presentation to the House of Commons is one signed by the headmaster and the whole teaching staff of Eton College.

THE model of the Channel Tunnel which was on view at Caxton Hall, Westminster, during last week was well patronised, and the voting of those who have inspected it has resulted in a large majority in favour of the scheme. The model is well made in sections, which show clearly the positions of the proposed tunnels in the chalk and the direction of the strata. An interesting point is the very slight variation of level which occurs at this part of the Channel bed.

THE death is announced of Prof. Y. Y. Tswetkoff, of the Moscow Petroffsky Forestry Institute. Soon after finishing his studies at the St. Petersburg University he obtained the degree of Master of Mathematics by a dissertation on surfaces subject to change without rupture or bend of their component parts. In 1864 he was commissioned by the Department of Agriculture abroad, and on his return he became extraordinary professor of the Moscow Institute of Forestry and Agriculture. In 1873 he became professor of mathematics at the Lycée. He read lectures also on physics and meteorology, and his auditorium was always crowded. In 1885 he retired owing to illness. He was most generous in helping poor students and others, and only after his death was it found that he had given away several thousand roubles in this way.

In the House of Commons on March 7 the President of the Board of Agriculture was asked whether, in view of the loss now sustained by fruit growers, it is the intention of the Government at an early date to propose legislation which will enable insect and other pests which infect fruit to be dealt with effectually; and, if it is intended to propose legislation, whether the Government will use every endeavour to bring it into force by May, in view of the fact that the disease will, during that month, begin to spread from the affected gooseberry plantations. In reply to the question, it was stated that the President of the Board of Agriculture hopes very shortly to be in a position to introduce legislation to confer on the Board and on local authorities further powers to deal with insect and other destructive pests.

Among the lecture arrangements at the Royal Institution after Easter we notice the following:—Prof. G. H. Bryan, two lectures on wings and aëroplanes; Prof. W. Stirling, three lectures on stimulation, luminous and chemical; Prof. G. H. F. Nuttall, two lectures on malaria, sleeping sickness, tick fever, and allied diseases; Prof. H. A. Miers, two lectures on the birth and affinities of crystals; Mr. H. F. Newall, two lectures on spectroscopic phenomena in stars, (1) chemistry, (2) motion; Sir James Dewar, three lectures on chemical progress—work of Mendeléeff and Moissan; Prof. S. P. Thompson, three lectures on studies in magnetism (the Tyndall lectures); Prof. W. C. McIntosh, two lectures on scientific work in the sea fisheries; and Sir Wm. H. White, two lectures on the contest between guns and armour. The Friday evening meetings will be resumed on April 12, when a discourse will be given by Prof. A. H. Church on conservation of historic buildings and frescoes; succeeding discourses will probably be given by Prof. C. S. Sherrington, Sir James Crichton-Browne, Prof. G. Chrystal, Prof. J. A. Fleming, Mr. A. H. Savage Landor, Sir James Dewar, and others.

A Reuter telegram from Rome on March 4, published in the *Times*, supplies information as to the programme of the Italian Government in the matter of the excavations at Herculaneum and other archæological schemes in Italy. It has been decided that the work shall be undertaken by the Italian Government, and the archæologists in charge of the Herculaneum excavations will probably be Profs. Dall'Osso and Pellegrini, of the University of Naples; Prof. Gabrici, of the Naples Museum; and Profs. Savignoni and Mariani. The Minister of Instruction, Prof. Rava, is making antiquities his special care, and has obtained the funds necessary to carry out an extensive programme. The yearly sum to be expended for antiquities and fine arts has been raised to nearly a quarter of a million pounds, and the appropriation for excavations has been doubled. The Minister has ordered the beginning on a large scale within a year of excavations at Ostia, the port of ancient Rome; excavations at Pæstum to find the remains of the great edifices of which Greek and Roman historians have spoken; he has obtained permission to expropriate all the houses surrounding the baths of Diocletian, and is spending 20,000*l.* to free those grand remains; and, finally, he has obtained 240,000*l.* for the construction of the proposed archæological promenade, which is to be finished within three years. It will start from the Roman Forum, and will pass by the Colosseum, going so far as the Baths of Caracalla on one side and the Baths of Titus and Trajan on the other.

Sir W. H. Perkin, F.R.S., presided at the annual dinner of the Society of Dyers and Colourists on March 8. Prof. Meldola, F.R.S., proposed the toast of "The Society," and said the dinner was fittingly held on the 100th anniversary of the introduction of coal gas as an illuminant in the streets of London. The society was, therefore, doubly pleased to welcome as its president the founder of the coal-tar colour industry. The introduction of the scientific spirit into this industry is largely due to the work of Sir W. Perkin. The society is doing a great work in the particular industry represented by it, especially in bringing together representatives of the industry and of science bearing upon the industry. Good work which the society is developing is, said Prof. Meldola, the system of giving prizes for the solution of technical problems. It is a departure which can only be commended, and it is to be hoped it will be imitated by many other technical societies. The president, in reply, referred to the great advances made in other countries in the coal-tar industry during recent years, and urged manufacturers in this country, in order to maintain their supremacy in this industry, to employ in their works the services of the best scientific men. Sir W. Perkin declared that the time for energetic research is while business is prosperous. If that is done there is very little probability of decline. In commemoration of the connection of Sir W. Perkin with the society, the council has decided to found a Perkin medal, which will be conferred for inventions of striking scientific and industrial merit connected with the tinctorial industry.

The Commercial Motor Vehicle and Motor Boat Exhibition, which was opened last week at Olympia by the Lord Mayor, is likely to prove a great success, as every kind of commercial interest is well catered for. The exhibits shown include various new forms of motor 'buses, lorries, chars-à-bancs, a motor police ambulance for London, numerous forms of trade vans, and a motor horse-box. Not the least interesting of the exhibits from an Imperial point of view is the motor van which is shortly to tour the country showing Canadian products. Tyres of all descriptions, and non-slip bands and devices occupy the gallery, and various new oils for motor lubrication are also much in evidence. Some well-finished motor boats are shown, the largest being a launch about 40 feet in length, made and fitted for the use of the Plymouth Port medical officer. A notable feature in this section is the increase in the number of boats which are propelled without the use of petrol, the paraffin engine being largely installed instead, thus obliterating one of the greatest objections to the motor boat, *i.e.* the danger of the petrol exploding. The boats are in some cases fitted with a seat for the driver similar to that in a car, and are provided with a brake. From a business point of view the exhibition should prove of great value, and is also of great interest as showing the progress made recently in heavy motor traction.

A meeting was held on March 7 to aid the work of the National League for Physical Education and Improvement at Londonderry House. The aims of the league are to stimulate public interest in the physical improvement of the people, to coordinate and extend the work of existing agencies, to make known the legal powers already possessed by public authorities, and to promote fresh legislation where necessary. Lord Londonderry presided, and in his opening remarks said there are few persons who are studying the condition of the people of this country who do not recognise the importance of hygiene and physical education. In dealing with the question of the teaching of hygiene in the schools, he said that medical inspection of the children should be periodically carried out; children should not be worried by over-inspection, and discretion should be exercised. As to the instruction of the children in the rules of health, care should be taken to use language which the child understands. Sir Lauder Brunton, in the course of an address, said that, in spite of all the charitable organisations and benevolent institutions in the country, infants are dying in millions, children are starved by thousands, they become weak, they are growing up burdens to themselves and useless to others, and, instead of being a strength to the country, they weaken it. The great weakness, misery, and crime in this country can only be attacked successfully by means of cooperation. The National League is endeavouring to effect the cooperation which is so much needed by bringing together all the individuals and corporations who are interested in the welfare of the coming generation.

A discussion on the best types of cases (combining economy with suitability) for exhibition purposes occupies a large portion of the February number of the *Museums Journal*. An article, illustrated by an excellent photograph, is also devoted to the new wing recently added to the Liverpool Museum.

It appears from a paper by Dr. D. Woolacott in vol. ii., part vi., of the Proceedings of the University of Durham Philosophical Society, that a raised beach in the Cleadon Hills has been unusually well exposed during the last two years. The beach is 100 feet above sea-level, but caverns and a sea-cliff indicate that the most recent depression of the country was as much as 150 feet.

The combined January and February numbers of the *Irish Naturalist* are devoted to an account of the natural history and geology of Lambay Island, county Dublin, now in the occupation of the Hon. Cecil Baring, under whose auspices the investigation has been undertaken, and who has himself contributed notes on the seals and other mammals. A number of naturalists have contributed to the work, which has resulted in the discovery of five new species of invertebrates, and has likewise added several forms to the British fauna and a much larger number to the fauna of Ireland.

We have been favoured with a copy of a paper from the *Jenaischen Zeitschrift* (vol. xxxix.), by Prof. Hubrecht, on the origin of annelids and chordates, and the systematic position of the Ctenophora and Platyhelminthes. As the "trophocœle" and "hæmocœle" theories are discussed at length, especially from the point of view of Prof. Lang, it is scarcely necessary to mention that the paper is of an extremely abstruse nature. Much importance is attached to the view that the Ctenophora are pelagic worms rather than cœlenterates, and that the Platyhelminthes are likewise an aberrant type.

To the fourth part of vol. xxxvi. of Gegenbaur's *Morphologisches Jahrbuch*, Augusta Ärnbäck-Christie-Linde contributes the first portion of a paper on the shrew-mice (Soricidæ) and their relationship to other mammals. This section of the paper is devoted to the anatomical part of the subject. It is mentioned that a lateral gland occurs in the males of the common shrew-mouse (Sorex) and water-shrew (Crossopus). Although the occurrence of such glands in the musk-shrews (Crocidura), generally in both sexes, is well known, no reference is made to their presence in the British species in such text-books as we have been able to consult.

Reference in these columns was recently made to Prof. Baldwin Spencer's description of emeu-bones from King Island, Bass Strait. To the January issue of the *Emu* Colonel Legge contributes notes on the extinct emeus of both that island and Tasmania. The author recalls having seen a pair of Tasmanian emeus in his boyhood, and states that they were slightly smaller than the mainland species. As this bird also lays a larger egg, it is regarded as distinct, although it does not appear to have received a scientific name. Colonel Legge withdraws, in a postscript, a name he proposed in the text for the King Island bird, owing to it having been already christened by Prof. Spencer.

"Parental Care among Fresh-water Fishes" is the title of a very interesting article, by Mr. Theodore Gill, published in the Smithsonian Report for 1905 (art. No. 1688). Despite Aristotle's account of the care displayed by the Macedonian glanis in the preparation of a breeding-site, it was long an axiom among naturalists that fishes displayed no parental care for their eggs and offspring. How erroneous was this idea is sufficiently exemplified by the present account, although it deals only with species inhabiting fresh waters. Representatives of a very large number of groups exhibit some degree of parental care, although this may be limited to clearing a space to receive the spawn. The highest development in this respect occurs in the sticklebacks, in which the kidneys and their adjuncts are specially modified to yield a thread employed in the construction of the nest.

In the shell-gallery of the Natural History Museum have been placed full-sized *papier-maché* models of two giant cephalopods, an Architeuthis and an Octopus or Polypus. Being suspended from the roof, they show to great advantage, and convey a good idea of the huge size attained by certain members of the class, although much larger forms are known. The giant squid, or Architeuthis, measures 40 feet in total length, although 30 feet of this are accounted for by the pair of attenuated tentacular "arms," the length of the body being only 10 feet. An additional interest attaches to this cephalopod on account of its constituting a large portion of the food of the cachalot. The models were obtained from Ward's Natural Science Establishment, Rochester, U.S.A. Another important addition to the collection is formed by two caribou, shot and presented by Mr. F. C. Selous, one representing the Yukon and the other the Newfoundland race. The former has antlers measuring just above 58 inches along the curve.

The report of the Botanical Club of Canada for 1905–6, prepared by the secretary, Dr. A. H. Mackay, has been received. It contains, as usual, a summary of the phenochrons or observations on the flowering of plants and other natural phenomena recorded from several hundred schools throughout Nova Scotia, and a table of general Canadian phenological observations. Dr. Mackay has also published a handy bibliography of Canadian botany for the year 1905.

In the *Lyttelton Times* (December 19, 1906) Dr. L. Cockayne pays a tribute to the work of the late Mr. Robert Brown, of Christchurch, New Zealand. By profession a shoemaker, he was at the same time an enthusiastic naturalist, keenly interested in the fauna and flora of the country. He devoted his energies primarily to the collection and identification of the New Zealand mosses, and contributed numerous papers during the last fourteen years that will be found in the Transactions of the New Zealand Institute.

An insidious disease of the cocoa-nut palm, known as "bud-rot," has been recognised for a considerable time, but the primary cause was not determined. The view is now held that decay is due to bacteria developing in the slimy coating found on the young protected organs. Although certainly existent in the East Indies, there was no record of its occurrence in Ceylon until last year a case was brought to the notice of the Government mycologist, Mr. T. Petch. The disease and its treatment are noted in vol. iii., No. 15, of the Circulars and Agricultural Journal of the Royal Botanic Gardens, Ceylon. In No. 17 of the same series Mr. Petch describes the root disease of the Para rubber tree caused by the bracket fungus, *Fomes semicostatus.*

In the course of an article in vol. i., No. 10, of the *Philippine Journal of Science*, on the active constituents of certain medicinal plants, Mr. R. F. Bacon refers to the substances used by the Filipinos for stupefying or poisoning fish. The fibre of *Entada scandens*, the bark of *Ganophyllum obliquum*, and the fruit of *Croton Tiglium* are commonly employed for the purpose. The two former contain saponin, the latter a poison allied to ricin, but it is not considered dangerous to eat fish poisoned by these substances. On the other hand, there is risk attending the consumption of fish poisoned with the fruits of *Anamirta cocculus* on account of the picrotoxin contained. The fruits of *Derris polyantha* and *Diospyros canomoi* are also used.

The Local Government Board has just issued a report on the micrococcus of epidemic cerebro-spinal meningitis (spotted fever), a disease which recently appeared in Glasgow, Belfast, Liverpool, and other places in the British Isles. The report is compiled by Dr. M. H. Gordon, and contains full details of the characters of the microorganism and its recognition.

The *Journal of Hygiene* for January (vii., No. 1, just issued) contains a number of interesting and important papers. Dr. Castellani describes certain cases of tropical fever associated with apparently new species of bacilli; Messrs. Dudgeon and Dunkley discuss the *M. neoformans,* found in cancer by Doyen; Prof. Hewlett and Mr. Barton outline the results of a chemical, microscopical, and bacteriological examination of twenty-six samples of London milk; and Dr. Arkwright describes the *M. catarrhalis,* met with in nasal catarrh, and its differentiation. Fleet-Surgeon Bassett-Smith, R.N., contributes an important paper on the treatment of Mediterranean fever by means of vaccines. Although a few cases did well, on the whole the results were disappointing.

We have received the first number of the "Annals of Tropical Medicine and Parasitology," edited by Prof. Ronald Ross, F.R.S., and issued by the Liverpool School of Tropical Medicine. It is intended to take the place of the separate memoirs on tropical medicine which have hitherto been issued by the school, and is to be issued at the subscription price of 10*s.* 6*d.* per volume of probably not less than four numbers. The present number, of 161 pages, contains an elaborate memoir, by Messrs. Newstead, Dutton, and Todd, on insects and other arthropods collected in the Congo Free State, illustrated with six plates; descriptions of two new species of African ticks, by Prof. Neumann, and of parasites in the Liverpool School Museum, by Prof. Looss; a paper on the presence of *S. duttoni* in the ova of the tick, *Ornithodoros moubata,* by Captain Carter, I.M.S.; and a note on the therapeutics of trypanosomiasis, by Messrs. Moore, Nierenstein, and Todd. The number is excellently printed and illustrated, and the general "get-up" all that can be desired. It bids fair to be one of the most important journals on tropical medicine in its scientific aspects.

In the *Naturwissenschaftliche Wochenschrift* (vol. vi., No. 8) Prof. H. Potonié gives an interesting historical summary of the various theories that have been propounded to explain the genesis of coal.

A paper contributed by Mr. W. R. Thomas to the Institution of Mining and Metallurgy, and published in the Bulletin (No. 29) of the institution, strikingly illustrates the manner in which modern mining appliances and methods are now being adopted in Cornwall. It describes the electrically-driven centrifugal pumping plant at the Tywarnhaile mine. Special interest is attached to the installation from the fact that Dowson gas is used to run the electric plant. The results obtained have proved eminently successful.

Advance statistics, subject to correction, issued by the Home Office, show that the British output of coal in 1906 was 251,050,809 tons, or 6·33 per cent. more than in 1905. The number of persons employed at the coal mines in 1906 was 882,345. The mineral production also included 2,971,173 tons of fireclay, 8,209,880 tons of ironstone, 2,546,113 tons of oil-shale, 1,824,415 tons of iron ore, 230,558 tons of rock salt, 151,915 tons of salt from brine, and 126,699 tons of slate. The number of persons employed at mines under the Metalliferous Mines Regulation Acts was 29,969.

In a paper read before the Society of Arts, published in the Journal of the society of March 8, Prof. W. Boyd Dawkins gives a summary of the results obtained in the investigation of the south-eastern coalfield. The paper contains a map of the coalfield between Dover and Canterbury, and sections of the strata in the borings at Dover, Penshurst, Ellinge, Brabourne, Waldershare, and Fredville. At present, the seams proved are at Dover, thirteen seams with an aggregate thickness of 22½ feet; at Waldershare, four seams 10 feet 3 inches thick; and at Fredville, three seams 7 feet thick. At Dover the coalfield is about 1000 feet below Ordnance datum. At Ropersole the Coal-measures were struck at a depth of 1180 feet, and at Ellinge at 1815 feet. Prof. Boyd Dawkins takes an optimistic view of the future of the coalfield, which he regards as an important national asset and a striking instance of the value of scientific research to the nation.

Very high temperatures are required in tempering the modern special tool-steels, and care has to be taken that contact with carbon or air is avoided lest the composition of the steel should be altered. A novel type of electric tempering furnace designed by Körting Brothers is described in *Engineering* of March 1. The steel is placed in a fused salt, which must have a high melting point, and should not evaporate to any great extent at high temperatures. With barium chloride a temperature of 1300° C. can be maintained in such a furnace. The furnace forms a square box built up of iron, asbestos, and fire-bricks, leaving in its interior a cubical crucible chamber. This space is filled with the salt, and two plates of iron attached to opposite walls serve as electrodes for the alternating currents, supplied by an oil transformer. When the salt is fused, the object is lowered into the molten mass, and the temperature controlled by means of a pyrometer and rheostats. The tools may be preheated up to red glow before being placed in the furnace. Primary currents of 50 or 100 periods and 200 volts are used. When keeping the furnace at its maximum temperature of 1300° C. for ten hours a day, about 2 lb. of barium chloride have to be replenished every day. The furnace lining is said to last about a year; the iron electrodes do not last so long. Barium chloride seems, so far, to be the best material for the extreme temperatures. For lower temperatures mixtures of barium chloride and potassium chloride are used. The crust of fused salt which adheres to the steel peels off at once when the steel is dropped into the cooling liquid. Local superheating is not to be feared in this kind of furnace, and the application of fused salts is attracting much attention.

AN interesting discussion on the advantages and disadvantages of heating buildings with gas stoves of various types, which was held at the meeting of the Royal Sanitary Institute on December 12 of last year, is printed in the March number of the Journal of the institute. Dr. Rideal, in opening the discussion, considered that as soot, carbon monoxide, and hydrogen sulphide are never present in the products of the combustion of coal gas in modern gas stoves, and as the proportion of oxygen in the air of a room is little changed when the heating is effected by a flueless gas stove, the use of flueless stoves was in several cases an advantage, especially when the economy of the heating effect was considered. The amount of carbon dioxide produced was not sufficient to be deleterious, and instead of causing defective ventilation, flueless stoves, especially those of a condensing type, seemed actually to remedy it. Several speakers took part in the discussion, many of them dissenting from the views expressed by Dr. Rideal. In particular, the passage of sulphur acids into the air when a flueless stove is used appears to present difficulties.

MESSRS. JOHN J. GRIFFIN AND SONS, LTD., yesterday entertained a number of visitors at their new premises in Kingsway. New physical and other apparatus were exhibited, and there were demonstrations of the properties of vessels made of silica glass; of the oil-pigment process, velox printing, among modern processes in photography; the wireless transmission of signals, the musical arc, and other physical phenomena. This opportunity of seeing instruments and processes in operation is likely to be appreciated by teachers and others, and Messrs. Griffin and Sons, Ltd., will probably be repaid for their enterprise.

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A COMET (1907*a*).—A telegram from the Kiel Centralstelle announces the discovery of a new comet by Prof. Giacobini at the Nice Observatory. The object was of the eleventh magnitude, and its position at March 9d. 10h. 10·9m. (M.T. Nice) was

R.A. = 7h. 4m. 31·4s., dec. = 18° 21′ 17″ S.

The daily motion is westward at the rate of 47′, and northward at the rate of 57′, per day. The above position lies in the constellation Canis Major, about 20′ E. and 1½° S. of Sirius.

SOLAR RESEARCH AT MEUDON.—In No. 5 (1907) of the *Comptes rendus*, MM. Deslandres and d'Azambuja describe, and give some of the preliminary results of, the solar researches carried out at Meudon, with several forms of spectrographs, during the year 1906. One of the principal difficulties encountered by M. Deslandres in his previous experiments has been to obtain a satisfactory slit so narrow that the finer dark lines of the spectrum might be completely isolated, and this difficulty was, to a great extent, overcome during the recent research by drawing a very fine clear line on the surface of a piece of chemically-silvered optical glass. By having a clear space above and below the slit, the solar spectrum was simultaneously photographed on each plate, thereby enabling the parallelism of the slit and the line, and the exactitude of the setting on the line, to be tested for each exposure.

Photographs taken on the centres of the fine iron lines at λ 4045 and λ 4385 are found to differ considerably from those taken on the degraded edges of the lines, for whilst the latter show simply the bright faculic areas, the former show a net-work of bright inequalities of very different form; the photograph with the setting on the centre of the line is supposed to represent the upper layers of the iron vapours. The differences between the images obtained with the K_3 and K_2 lines are not so marked as was expected, although many of the bright areas obtained with the latter are not to be found on the K_3 images. No relation between the K_3 images and the dark calcium flocculi of Prof. Hale's photographs could be established, nor could the similarity of the former with the dark areas produced by photographs on the dark hydrogen lines be recognised.

THE MARKINGS AND ROTATION PERIOD OF VENUS.—Mr. Denning, in continuing his series of articles on the planets in the March number (No. 381) of the *Observatory*, discusses the contradictory results which have been derived from observations of Venus concerning the existence of permanent markings on the planet's surface, and the time it takes the planet to perform one rotation on its axis. He points out that whilst Mr. Lowell records that he has seen the markings when their contours have "had the look of a steel engraving," numerous other very careful observers have failed to distinguish anything which might be recognised as permanent. Similarly, a large number of observers have arrived at the conclusion that the rotation period is about 23h.–24h., whilst others, including Schiaparelli, have concluded that it is about equal to the period of the planet's revolution in its orbit. The spectroscopic results are similarly in opposition.

Summing up the results of the discussion, Mr. Denning concludes that after the earnest application of observers during three centuries, the problems of the configurations and of the axial rotation remain unsolved, the difficulties having, as yet, proved insuperable.

THE ELECTRICAL INFLUENCE OF THE SUN.—No. 8, vol. vii. (February 23), of the *Revue Scientifique* contains an interesting discussion, by Dr. A. Nodon, of the electrical influence of the sun on the earth.

After giving a historical account of the subject, the author proceeds to describe the experimental results obtained by M. Brunhes and by himself, from which follows the deduction that the sun produces, at the earth's surface, a positive electrical induction of variable magnitude. The amount of this induction is far greater than that attributable to the actino-electric action of the luminous radiations, whilst the interposition of clouds before the sun arrests the induction effect. Other possible causes are discussed, and it is shown that independently of these, there still remains an effective induction directly due to the sun's charge alone.

In a second part of the discussion, published in No. 9 of the same journal, Dr. Nodon considers the effect of the solar influence on the planets, on comets, and on the earth in particular, and in conclusion he urges the fundamental importance of the study of solar physics on the grounds that a large number of meteorological phenomena appear to be directly connected with the solar changes.

RECENTLY DISCOVERED ASTEROIDS.—The provisional elements of the orbits of twenty-five recently discovered asteroids are published in No. 4156 (February 21) of the *Astronomische Nachrichten* by Herr J. Bauschinger, of the Astron. Rechen-Institut, Berlin. These asteroids were discovered between August, 1905, and April, 1906, and their designatory numbers range from 570 to 598.